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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,477	04/30/2001	Chine-Gie Lou	TS2000499	2319

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EXAMINER	
GUERRERO, MARIA F	

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/845,477	Applicant(s) LOU, CHINE-GIE	
	Examiner Maria Guerrero	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *24* is/are allowed.

6)☒ Claim(s) *13-17 and 19-23* is/are rejected.

7)☒ Claim(s) *18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This Office Action is responsive to the Response filed July 10, 2003.

Claims 1-12 are canceled.

Claims 13-24 are pending.

Claim Objections

2. Claims 13 and 24 are objected to because of the following informalities: the claims recited "Lightly Doper Diffusion"; it is suggested to replace "Doper" by –Doped-. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 13-17 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pey et al. (U.S. 6,180,501) in view of Zhen et al. (U.S. 5,858,870).

Pey et al. teaches providing a semiconductor substrate having: a gate electrode (a pad oxide layer and a polysilicon layer) with gate spacers, shallow trench isolation regions, source and drain regions, and LDD regions (Fig. 1-7, col. 5, lines 1-60). Pey et al. discloses forming an etch stop material (silicon nitride) over the surface of the substrate and patterning the pad oxide layer, the polysilicon layer, and the etch stop material (Fig. 1-2, col. 5, lines 1-15).

Pey et al. teaches forming a salicide layer by depositing a Ti/TiN layer (280 to 350 angstroms) over the surface of the substrate, including the surface of the gate spacers, and performing a first RTP anneal (col. 5, lines 60-67, col. 6, lines 1-10). Pey et al. discloses creating a layer of titanium silicide over the surface of the source and drain regions, and removing the unreacted Ti/TiN layer (col. 6, lines 5-15). Pey et al. shows depositing a layer of dielectric (BPSG) over the surface of the layer of etch stop material, polishing the surface of the layer of dielectric down to the surface of the etch stop material, and removing the layer of etch stop material (col. 6, lines 23-50).

Pey et al. teaches depositing a Ti/TiN layer over the surface of the polished layer of dielectric including the exposed surface of the polysilicon layer and performing a second anneal (col. 7, lines 55-60). Furthermore, Pey et al. teaches creating reacted salicide material over the surface of polysilicon, removing the unreacted material, and performing a third RTP anneal at 850°C for about 10 to 30 seconds (col. 6, lines 5-15, col. 7, lines 55-60).

Pey et al. fails to show using a boronitride layer as the polish stop layer. However, Zhen et al. shows the use of boronitride layer as a stopping layer is well known in the art (Abstract, col. 2, lines 28-30, col. 3, lines 18-20, 50-52, col. 4, lines 42-44, 65-67). The polish rate of the filler material being larger than the polish rate of boronitride in order to prevent corrosion is inherent from the disclosure because Zhen et al. teaches the boronitride layer use as hard mask and as the stopping layer (Abstract, col. 4, lines 42-44, 65-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Pey et al.'s process by using boronitride instead of silicon nitride as taught Zhen et al. in order to better control the etch selectivity during the planarization process.

Regarding the claimed thickness, temperature, and time, a particular parameter must first be recognized as a result-effective variable, i.e., a variable, which achieves a recognized result, before the determination of the optimum or workable ranges of, said variable might be characterized as routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Geisler, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

Response to Arguments

4. Applicant's arguments with respect to claims 13-17 and 19-23 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

5. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 24 is allowed.

The following is a statement of reasons for the indication of allowable subject matter: In the examiner's opinion, it would not have been obvious to a person of ordinary skill in the art to include the photoresist layer as a filler material in combination

with the boron nitride as the stop layer as claimed because there is not motivation or suggestion.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-49055. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

María Guerrero
Maria Guerrero
Patent Examiner
September 10, 2003